Scrupulosity, Trauma And Disgust, Oh My! Assessing The Potential Relation Between Religiosity, Trauma Symptoms And Disgust

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SCRUPULOSITY, TRAUMA, AND DISGUST, OH MY!

ASSESSING THE POTENTIAL RELATION BETWEEN RELIGIOSITY, TRAUMA
SYMPTOMS AND MORAL DISGUST.

A Thesis
Presented in partial fulfillment of requirements
for the degree of Master of Arts
in the Department of Psychology
The University of Mississippi

by

BROOKLEE L. TYNES

MAY 2016
ABSTRACT

Lifetime prevalence rates for Posttraumatic Stress Disorder (PTSD) are estimated to be 6% in the general population. In the United States alone, an estimated 5.2 million adults will experience PTSD within the year (National Comorbidity Survey, 2005). However, a much larger number of the population will experience some form of trauma over the course of their lifetime. Research has demonstrated that the development of PTSD may be attributed to some factors (e.g., temperamental vulnerabilities, social ecological factors), which may predispose individuals to the development of the disorder. The purpose of this study was to test the association of moral disgust with scrupulosity and posttraumatic stress symptoms (PTSS). Disgust, one of the six basic emotions is most commonly associated with facial grimaces in response to foods or dangerous substances. Particularly, moral disgust is said to occur when an individual experiences a negative reaction to moral violations or views actions as “sick,” “twisted,” or lacking normal human motives (Rozin, Haidt, & McCauley, 2000). Results revealed that scrupulosity and obsessionality were each positively correlated with posttraumatic stress symptoms ($p = .41$, $p = .39$ respectively). Moral disgust ratings were also correlated to obsessionality ($p = .21$), but not posttraumatic stress symptoms ($p = .03$, not significant). A hierarchical regression revealed moral disgust did not predict PTSS when controlling for scrupulosity; however, post-hoc analyses suggested that the overall TDDS did significantly contribute to the regression model. Implications of the findings and future directions are discussed.
DEDICATION

This thesis is dedicated to my unwavering support system of family, mentors, and friends.

In particular, I thank my husband, Charley, for his encouragement throughout this process.
**LIST OF ABBREVIATIONS AND SYMBOLS**

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTSS</td>
<td>Post Traumatic Stress Symptoms</td>
</tr>
<tr>
<td>TDDS</td>
<td>Three Domains of Disgust Scale</td>
</tr>
<tr>
<td>PTCI</td>
<td>Post Traumatic Cognitions Inventory</td>
</tr>
<tr>
<td>PIOS</td>
<td>Pennsylvania Inventory of Scrupulosity</td>
</tr>
<tr>
<td>OBQ-44</td>
<td>Obsessive Beliefs Questionnaire</td>
</tr>
</tbody>
</table>
ACKNOWLEDGMENTS

It is with utmost sincerity that I express my gratitude to my advisor, Dr. Danielle Maack and my committee members, Drs. Alan Gross and John Young. I am thankful for the guidance afforded me in this learning process.
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INTRODUCTION

Almost all individuals are exposed to some form of trauma at least once in their lives; however, for the 6% (lifetime prevalence rate for the general population; Zohar et al., 2008) who experience chronic hyper-arousal, re-experiencing, avoidance and emotional numbing following a traumatic event, symptoms are indicative of a diagnosis of Post Traumatic Stress Disorder (PTSD; APA, 2000). By definition, PTSD is characterized by experiencing a Criterion A event (trauma) and subsequent lasting negative reactions to this trauma. However, the experience of a traumatic event is only one factor related to the potential development of PTSD. Indeed, other potential risk factors include demographic variables (gender; Kline et al., 2013), cognitive and temperamental vulnerabilities (anxiety sensitivity; Fedroff et al., 2000; behavioral inhibition, Myers, VanMeenen, & Servatius, 2011), and contextual factors (history of abuse, family mental health history; see DiGangi, et al., 2013; Brewin et al., 2000; Elwood et al., 2009 for reviews).

One potential cognitive vulnerability of interest is the emotion of disgust as it relates to post traumatic stress symptoms (PTSS). To date, there is a paucity of research exploring the potential role of disgust and PTSS (Engelhard, Olatunji, & Jong, 2010). Disgust, considered one of the six basic emotions, has become understood as far more complex since Darwin’s observation and analysis of its connection with eating and tasting (Rozin, Lowery, & Ebert, 1994). Believed to originate as a response to oral distaste (e.g., reflex tasting of a lemon by infants), disgust is accompanied by specific facial grimacing. Specifically, the disgust reaction is most easily identified by accompanying facial expressions that range from the wrinkling of the
nose to the movement of the mouth. This mouth movement, referred to as the gape in both animals and humans, can also be seen as the retraction of the upper lip (Ekman and Friesen, 1978). From an evolutionary perspective, these facial expressions serve as higher order functions that communicate the emotion. Evolutionarily, gape may serve to expel hazardous materials while the nose wrinkle fights the inhalation of toxins or strong unpleasant odors (Rozin, Lowery, Ebert, 1994). Although originating as a response to oral distaste, the emotion of disgust may later be shaped through development of learning and perhaps culture (Rozin, Lowery, & Ebert, 1994). As a multi-faceted emotion, disgust can be classified into four major categories: core, contamination, animal reminder, and moral disgust. Each of these areas, while they have different eliciting factors, share the common trait that individuals reject certain factors from themselves (Rozin, Lowery, Ebert, 1994). Whereas the first of the four domains of disgust (i.e. core) is learned and executed early in life, the other three become more developed later (Rozin, Lowery, & Ebert, 1994).

Domains of Disgust

Core disgust is defined as the reactive emotion of disgust elicited to guard individuals from potentially harmful materials such as foods or body substances (Olatunji et al., 2012). Spoiled foods, waste (bodily, such as feces, or garbage), and small animals associated with disease are categorized within this core disgust domain (Olatunji et al., 2008). Recently, core disgust was found to be associated with visual avoidance and may also play an active role in behavioral avoidance (Olatunji et al., 2008). For example, individuals who experience core disgust may not only look away from “disgusting” stimuli, but will shape their behaviors (i.e., avoid situations) where encountering similarly disgusting stimuli may be present. Core disgust has demonstrated associations with specific phobias including arachnophobia (Olatunji et al.,
and blood-injection injury (BII) phobia (Olatunji et al., 2010) illustrating this associated behavioral avoidance.

Contamination disgust includes evocation of the emotion of disgust following violation of body areas associated with sex, gore, lack of proper hygiene, and death contamination that arises with physical contact which is undesired (McCauley, Rozin & Markwith, 1997; Olatunji et al., 2008). Often the experience of this emotion is the result of one’s interaction with another individual or object thought to be affected by disease, illness, or sometimes immoral characteristics (Olatunji et al., 2008). Research has demonstrated that contamination fear often observed in obsessive-compulsive disorder may be predicted by contamination disgust (Olatunji et al., 2010).

Animal origin disgust may originate from humans’ desire to not be grouped into the same class with animals (Rozin, Lowery, & Ebert, 1994). Sawchuck et al., (2000) suggest that certain properties of animals such as exposed tissues and bodily organs act as reminders to humans of their animal nature and therefore elicit disgust reactions. The over-arching theme to these violations and animal reminders is the violation of the human body envelope or exterior. Physiological evidence of increased facial muscle tension and decreased heart rate have been demonstrated when exposed to visual stimuli of body envelope violation (Olatunji et al., 2008).

Moral disgust represents the fourth domain of disgust. This domain is classified by disgust evoked from the belief that an individual lacks certain ideals that are more generally expected from the population based on a particular code of conduct, or that others are “sick” or “twisted” (Olatunji et al., 2012). More specifically, moral disgust is a relatively new construct and lacks certain delineation thus far (Olatunji, David, & Ciesielski, 2012). Because moral disgust appears to function as revulsion to behaviors or individuals who act inappropriately, it is
important to understand what situations and violations may elicit this response. When considering a potential cognitive vulnerability related to PTSS, it seems that moral disgust may be a likely domain to explore. Litz et al. (2009) explored the possible role of “moral injury” in war veterans. As soldiers are exposed to both ethical and moral dilemmas during their time of service they may experience moral or cognitive dissonance in relation to having their moral or ethical ideals violated. While there is still a lack of support for moral disgust specifically related to posttraumatic stress disorder, its implications are of relevance as researchers attempt to better conceptualize this understudied domain of disgust.

**Disgust Propensity**

Disgust propensity is defined as an individual’s tendency to experience disgust once presented with particular stimuli (Bomyea & Amir, 2010). Previous studies have indicated that greater disgust propensity is significantly associated with anxiety related psychopathologies (Olatunji, Tomarken, & Puncochar, 2013). Similarly, it is possible that disgust propensity may function in the etiology of PTSD. Trauma is often associated with blood or tissue damage in combat, eliciting core or animal-origin disgust or unwanted sexual contact, which may elicit “mental pollution or contamination,” (Bomyea & Amir, 2010). Due to the association of vivid imagery and sensation of disgust (Woody & Teachman, 2000), individuals who are more likely to experience disgust may also be more prone to later experiencing memories of a traumatic event (Bomyea & Amir, 2010). To test this assertion, Bomyea and Amir (2010), assessed the relation between intrusive thoughts and emotional trait characteristics (emotional reactions to stimuli). The researchers hypothesized that higher disgust propensity would be related to greater likelihood to experience intrusive thoughts. Prior to exposure to a graphic film featuring severely burned bodies, participants completed self-report measures assessing trauma, anxiety, depression
and disgust. In an effort to screen out individuals with existing PTSS, only participants scoring below 5 on the Posttraumatic Diagnostic Scale (Foa et al., 1997) viewed a graphic film and completed a task following the film to measure intrusive thoughts. Results indicated that the number of distressing thoughts participants recalled about the video was directly related to higher levels of disgust propensity (Bomyea & Amir, 2010). Thus, the study suggests higher disgust propensity plays a role in predicting distressing thoughts, even when controlling for emotional trait characteristics (symptoms of anxiety and depression).

Additionally, research suggests the development of PTSD might be more likely to occur when examined from a diathesis stress model in which characteristics of anxiety of disgust are more salient (Ingram & Price, 2001). In a study by Olatunji et al., (2012), the role of anxiety and disgust sensitivities associated in the development of PTSD were assessed. Following diagnostic interview and computer administered measures, scores on anxiety and disgust sensitivities were compared among 21 veterans who met DSM-IV criteria for PTSD, 16 veterans who had experienced a traumatic event but did not meet criteria for a PTSD diagnosis, and 22 nonveteran controls. Results indicated a high correlation among disgust sensitivity and anxiety sensitivity for PTSD veterans, but not for the other two groups (veterans experiencing traumatic events without PTSD or nonveteran controls). These findings suggested low disgust sensitivity may in fact play a role (i.e. protective factor) in experiencing less distress in traumatic events (Olatunji et al., 2014).

Engelhard, Olatunji, & Jong (2011) suggest that the link between disgust and PTSS may be better explained by particular types of learning. Signal learning (classical conditioning) and evaluative learning may be mechanisms for the development of PTSS following a traumatic experience (Engelhard, Olatunji, & Jong, 2011). With strong peritraumatic emotions (expressed
emotions of horror, helplessness, fear) during the time of trauma, it is hypothesized that similar strong responses may occur during exposure to assumed contamination or transgressions (Engelhard, Olatunji, & Jong, 2011; Rozin, Haidt & Fisncher, 2009; Rozin, Haidt, & McCauley, 2009). In Engelhard, Olatunji & Jong’s 2011 study, the researchers aimed to assess if PTSD symptoms were moderated by disgust sensitivity (Engelhard, Olatunji, & Jong, 2011). Soldiers assigned for deployment in Afghanistan (N=174) were administered a battery of measures prior to deployment assessing PTS symptoms, neuroticism measures and military characteristics (Engelhard, Olatunji, & Jong, 2011). Following a 6-month period post deployment, 138 participants were retested with questionnaires specifically related to traumatic events, related emotions, PTSD, and disgust sensitivity and propensity. Following 15 months of post deployment, 107 participants completed questionnaires related to PTSD symptomology (Engelhard, Olatunji, & Jong, 2011). On average, the number of traumatic events experienced was 14.7. Though most events associated with disgust involved injury or death, some were associated with what was considered moral disgust such as infidelity or role confusion (Engelhard, Olatunji, & Jong, 2011). Results revealed peritraumatic disgust did predict PTSS scores independently of peritaumatic fear. While peritraumatic disgust was associated with disgust propensity, it was only significantly correlated to animal-reminder disgust, not other domains. Though disgust sensitivity correlated with PTSS scores after the 6-month point, assessment at the 15-month period revealed no disgust variables were correlated significantly with the PTSS scores. Significant results were found on the moderating effects of disgust sensitivity in the relationship between peritraumatic disgust on PTSD symptoms (Engelhard, Olatunji, & Jong, 2011). This study demonstrated a relationship between the development of PTSS and peritraumatic disgust. Results also suggested that other disgust domains (namely,
moral disgust) may play a role in development of PTSS, not merely core or animal reminder
disgust and are worth further investigation.

**Scrupulosity**

When considering moral disgust, scrupulosity, defined as obsessive tendencies in relation
to fear of sin and compulsive action to eliminate sin by continuous participation in religious acts
(Allen & Wang, 2014), may be a construct important in understanding the potential relation of
moral disgust and PTSS. Excessive guilt about obsessions that are immoral or against religious
beliefs can cause distress (Miller & Hedges, 2008). As it seems that the premise of religious
ideals reportedly lies within the realm of what is deemed moral and just and may be attributable
to our innate emotional responses (i.e., moral disgust) to particular stimuli, it is important to
discuss this construct. Scrupulosity has been described as a “phobia concerning sin” and “seeing
sin where there is none” (Ciarrocchi, 1995). Further questions lie in understanding where the line
between morality as a function of the basic emotion of disgust meets morality as defined by a
greater obsessive tendency developed from fear of breaking religiously prescribed law. As data
demonstrate that scrupulosity can impair day to day functioning, it may also suggest that there
are also implications on functioning concerning the construct of moral disgust. While research
has shown evidence for the implications of scrupulosity as a subset of obsessive compulsive
disorder (Foa & Kozak, 1995), further research is needed in understanding the role of
scrupulosity and moral disgust in disorders (e.g., PTSD).

Findings in OCD research suggest that disgust sensitivity and propensity may mediate the
relationship with certain obsessive thoughts (Olatunji et al., 2005). In a study by Olatunji et al.
(2005), researchers examined the relations between fearfulness, religious obsessions and disgust
sensitivity. The researchers hypothesized fearfulness and disgust sensitivity work together to
relate to religious obsessions (Olatunji et al., 2005). Of particular interest to the work of this paper, the second hypothesis aimed to examine whether particular fears and domains of disgust (moral disgust), would predict religious obsessions over other cognitive vulnerabilities. Undergraduates (100) completed measures concerning religious obsessions, fearfulness, and disgust. Results of the study revealed positive correlations among all variables of interest. Also consistent with prediction, results demonstrated a significant, positive relation between disgust sensitivity and religious obsessions when controlling for general fearfulness and contamination fear. Specifically, disgust domains most highly associated with religious obsessions were subscales related to morality and moral violations. This may indicate a direct relationship between disgust sensitivity and religious obsessions (i.e. scrupulosity; Olatunji et al., 2005). Of interesting note, though Olatunji and colleagues did not find disgust as a distinct construct responsible for prediction of scrupulosity, results of a confirmatory factor analysis on the Pennsylvania Inventory of Scrupulosity (PIOS; Abromowitz et al., 2001) revealed that the trait of anxiety most probable as a risk factor centered on obsessions of morally offensive thoughts (2007). With evidence of the role that disgust and moral implications plays in the etiology of scrupulosity, it is of value to understand if these traits and emotions are related to other disorders or symptoms, particularly PTSS.

**Obsessionality**

As research suggests that OCD may be implicated in disgust sensitivity, evidence also supports its relationship to early trauma experiences. Pennebaker (1985) proposed that when individuals experience behavioral inhibition (the avoidance of thoughts or physical reminders following a traumatic event) they are more likely to engage in obsessive tendencies following the trauma as well. In particular, childhood trauma is considered a risk factor in the development of
OCD, and oftentimes cited as an obstacle to treatment efficacy (Semiz, Inanc, & Bezgin, 2014). Specifically, 120 participants diagnosed with OCD, 62 of which were determined to be treatment resistant were assessed using the Yale-Brown Obsessive Compulsive Scale (Y-BOCS), Beck Depression Inventory, Beck Anxiety Inventory and other measures for dissociation and traumatic experiences. Results indicated the treatment resistant group endorsed significantly more intense OCD symptoms as well as trauma symptoms (Semiz et al., 2014). Similarly, hoarding, a disorder associated with obsessive-compulsive tendencies has also been found to be related to higher endorsement of traumatic experiences. Hoarding can be characterized as a particular subtype of obsessive-compulsive disorder, often with increased compulsions of the saving (of items) type (Wheaton, Timpano, LaSalle-Ricci, Murphy, 2008). Hartl, Duffany, Allen, Steketee, & Frost (2005), compared 29 individuals who met criteria for hoarding with 36 controls. Participants were asked to complete a Traumatic events scale—lifetime (TES-L), Cognitive failures questionnaire (CFQ), as well as hoarding measures. Results indicated that past diagnoses of PTSD were more frequent among hoarders as well as significantly greater report of traumas experienced (Hartl et al., 2005). Results from this study support the relation between hoarding disorder (with obsessive type symptoms) and posttraumatic stress symptoms. Due to the relationship between childhood trauma and the experience of obsessive compulsive tendencies, it seems necessary to examine the relationship between obsessionality and posttraumatic experiences and the implications each difficulty may have on the other.

Obsessive compulsive disorder may often involve topics related to morality. As mentioned previously, strict adherence to religious ideals and standards in an obsessive manner, known as scrupulosity, is a subset of this disorder. Recent research by Abromovitch, Doron, Sar-El, and Altenburger (2013) aimed to determine if threats to morality of self may prime
individuals for obsessive compulsive cognitive biases. Participants (n=124) were recruited for the study and completed measures related to depression, stress, self-esteem and obsessive compulsive tendencies. Participants were assigned to one of four groups: negative sports, positive morality, positive sports, and negative morality. Depending on their group assignment, participants were asked to complete computerized tasks designed to demonstrate where the participant fell on a bell curve related to the specific condition (i.e., labeling their morality as low). Results revealed that the priming of negative self-perceptions regarding morality can work to activate cognitive biases. These negative cognitive biases have been demonstrated to contribute to the etiology of obsessive compulsive disorder (Abromovitch et al., 2013). By cultivating negative moral self-judgments, individuals assign more value to the thoughts and cognitive biases they experience. Therefore, individuals are more likely to focus and find greater importance in negatively valenced thoughts and biases, which in turn works to maintain and exacerbate obsessive compulsive behaviors (Abromovitch et al., 2013). When considering the relationship between trauma, morality and obsessional tendencies, research suggests that obsessionality may play a moderating role between the two aforementioned constructs.

Taken together, there is a growing interest in the relation between the emotion of disgust and PTSS. Up to this point, research has focused on the overall construct of disgust in relation to PTSS. Currently only a small body of research examining the relation between disgust and PTSS exists (see Olatunji et al., 2012; Engelhard, Olatunji, and DeJong, 2011). Moreover, there are no published studies currently assessing the specific relation between moral disgust and PTSS. Foa (1999) suggested that individuals who hold more rigid “self-concepts,” be they positive or negative increase their vulnerability to develop PTSD. Therefore sensitivity to moral disgust may increase the likelihood for an individual to experience PTSS following experience of a traumatic
event. As such, the current study assessed the relation between moral disgust and PTSS.

Hypotheses for the current study were as follows: 1) PTSS would positively relate to both moral disgust, obsessionality and scrupulosity; 2) Moral disgust would predict PTSS over and beyond the construct of scrupulosity. The expectation was that even when controlling for scrupulosity (adherence to moral and religious values) moral disgust would still have a significant impact on PTSS. The final hypothesis for the current study was that the construct of obsessionality would moderate the relationship between moral disgust and PTSS.
II. METHODOLOGY

Participants

The current study employed archival data from a questionnaire study approved by the University of Mississippi IRB. Undergraduates at the University of Mississippi were recruited and participated in exchange for course credit. Participants were 283 students (42.9% male) with aged 18-44 years (M=20.0, SD = 2.87). The ethnic breakdown was as follows: 70.3% Caucasian, 22.6% Black, 2.8% Asian, 1.1% Asian or Pacific Islander, and 3.2% identified as Multiracial.

Measures

The Three Domains of Disgust Scale (TDDS; Tybur, et al., 2009) is a 21 item self-report measure assessing disgust sensitivity related to pathogens, sex, and moral situations. Items are rated on a 0 to 6 scale (0 being not disgusting and 6 being extremely disgusting). The scale is composed of three factors that are each internally consistent and related to other measures of disgust (moral disgust, sexual disgust, and pathogen disgust). The total scale demonstrated good internal consistency ($\alpha = .89$). The moral disgust sub-scale consists of 7 items in which proposed actions (i.e. deceiving a friend) are rated on the same Likert type scale. The scale has demonstrated good convergent and divergent validity, as well as test-retest reliability (Olatunji et al., 2012). The moral disgust subscale was used to address the current research question and demonstrated good internal consistency ($\alpha = .88$). For subsequent post hoc analyses the pathogen disgust and sexual disgust subscales were implemented. The pathogen disgust subscale consists of 7 items in which events such as “seeing a cockroach run across the floor” are rated on a 7 point Likert scale (0 = not disgusting, 6 = extremely disgusting). The sexual disgust subscale
similarly consists of 7 items, rated in the same manner and relates to sexual items that may be found disgusting (i.e., hearing two strangers have sex). The pathogen and sexual disgust subscales demonstrated good internal consistencies (α = .86 and α = .85) respectively.

The Post-traumatic Cognitions Inventory (PTCI; Foa et al., 1999) is a 33-item self-report questionnaire assessing cognitions often associated with traumatic events. The scale produces three subscales: negative thoughts about the world (“The world is a dangerous place”), negative self-views (“I am a wimp”), and self-blame (“I am ashamed of myself”). Questions are asked on a Likert scale ranging from 1 (completely disagree) to 7 (completely agree). Initial psychometric analysis revealed acceptable internal consistency as follows: Negative Thoughts About the world, α = .88; Negative Self Views, α = .97; Self Blame, α = .86, total score, α = .97 (Foa et al., 1999). In the current study, excellent internal consistency was demonstrated (α = .92)

The Pennsylvania Inventory of Scrupulosity (PIOS; Abromowitz et al., 2001) is a 19-item scale used to assess an individual’s adherence to religious and moral standards. Items such as “I worry about heaven and hell” are rated using a Likert scale 0 (never) and 4 (constantly) in relation to how often the individual thinks about the particular item. The scale consists of a single factor and has been psychometrically tested. The PIOS psychometrically demonstrates good internal consistency (α = 0.93) and good convergent and discriminant validity (Abromowitz et al., 2001). Internal consistency of the PIOS in the current study was excellent (α = .93).

The Obsessive Beliefs Questionnaire 44 (OBQ-44; OCCWG, 2005; Myers, Fisher & Wells, 2006) is a 44-item self-report questionnaire developed to assess beliefs associated with obsessive compulsive disorder. The OBQ-44 was a derivative of the OBQ-87 which was analyzed, revealing the 44 highest loading items, now used for the OBQ-44. Items consist of beliefs such as “Even minor mistakes mean a job is not complete” and “Having nasty thoughts
means I am a nasty person.” These statements are rated using a 7-point Likert scale 1 (Disagree very much) and 7 (Agree very much) according to the degree to which an individual holds each belief statement. The OBQ-44 demonstrated good internal consistency in the present sample (α = .89).

**Procedures**

Following consent, individuals completed a large packet of self-report questionnaires via pencil and paper with measures counterbalanced. Only the aforementioned measures were used for analysis in the proposed study. Prior to data analysis, data was cleaned and missing values were computed using the expectation maximization algorithm in SPSS. Mahalanobis distance was performed to remove any outliers greater than three standard deviations from the mean.
III. RESULTS

Preliminary Analyses

Correlational analysis was used to test the initial associations between the constructs of interest (i.e. PTSS, moral disgust, obsessionality, and scrupulosity). Preliminary analyses are provided in Table 1. All variables were significantly correlated, as expected, with the exception of associations with the moral disgust subscale of the TDDS. Surprisingly, the TDDS moral subscale was not found to be associated with either the PTCI or PIOS.

Table 1. Summary of Preliminary Correlational Analyses

<table>
<thead>
<tr>
<th></th>
<th>PTCI</th>
<th>TDDS-Moral</th>
<th>PIOS</th>
<th>OBQ-44</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTCI</td>
<td>1</td>
<td>.03</td>
<td>.42**</td>
<td>.39**</td>
</tr>
<tr>
<td>TDDS-Moral</td>
<td>.03</td>
<td>1</td>
<td>.08</td>
<td>.21*</td>
</tr>
<tr>
<td>PIOS</td>
<td>.42**</td>
<td>.08</td>
<td>1</td>
<td>.20*</td>
</tr>
<tr>
<td>OBQ-44</td>
<td>.39**</td>
<td>.21*</td>
<td>.20*</td>
<td>1</td>
</tr>
</tbody>
</table>

Note: (N = 260); PTCI = Post Traumatic Cognitions Inventory; TDDS-Moral = Three Domains of Disgust-Moral Subscale; PIOS = Pennsylvania Inventory of Scrupulosity; OBQ-44 = Obsessive Beliefs Questionnaire; p < 001**; p < .01*

Primary Analyses

A hierarchical regression was employed to test the hypothesis that moral disgust, using the TDDS and acting as the independent variable, would predict PTSS (as measured by the PTCI), the dependent variable, controlling for scrupulosity (as assessed by the PIOS). The hierarchical regression consisted of two steps (see Table 2). In the first step, the PIOS was
entered and in step two the TDDS-moral disgust subscale was entered. The hierarchical regression revealed that scrupulosity contributed significantly to the regression model, F (1, 259 =54.04, p < .001), and accounted for 17.3% of the variance. In step two, moral disgust was added to the model; however, there was no change in R². As such, no further analyses were run with the moral disgust subscale.

**Table 2. Summary of Hierarchical Regression Analysis for Variables Predicting PTSS**

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>Beta</th>
<th>Change R²</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1: Scrupulosity (PIOS)</td>
<td>0.87</td>
<td>0.12</td>
<td>0.42</td>
<td>0.17</td>
<td>0.000**</td>
</tr>
<tr>
<td>Step 2: TDDS Moral</td>
<td>0.87</td>
<td>0.17</td>
<td>0.42</td>
<td>0.17</td>
<td>0.92</td>
</tr>
</tbody>
</table>

*Note:* (N = 260); PIOS = Pennsylvania Inventory of Scrupulosity; TDDS = Three Domains of Disgust-Moral Subscale; *p* < .001**

**Post Hoc Analyses**

Due to the lack of relation between the moral disgust subscale of the TDDS and PTSS, post hoc analyses were conducted to examine what relation (if any) the TDDS as a whole (or broken down into all subscales (moral, pathogen, and sexual disgust) might exist between the variables of interest (PTSS, OBQ-44, PIOS). The correlational matrix with all TDDS subscales can be found in Table 3.
### Table 3. Summary of Post Hoc Correlational Analyses

<table>
<thead>
<tr>
<th></th>
<th>PTCI</th>
<th>PIOS</th>
<th>OBQ-44</th>
<th>TDDS Total</th>
<th>TDDS Pathogen</th>
<th>TDDS Sexual</th>
<th>TDDS Moral</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTCI</td>
<td>1</td>
<td>.42***</td>
<td>.39***</td>
<td>-.04</td>
<td>-.05</td>
<td>-.07</td>
<td>.03</td>
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<tr>
<td>PIOS</td>
<td>.42***</td>
<td>1</td>
<td>.20**</td>
<td>.05</td>
<td>.05</td>
<td>-.01</td>
<td>.08</td>
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<tr>
<td>OBQ-44</td>
<td>.39***</td>
<td>.20**</td>
<td>1</td>
<td>.23***</td>
<td>.20**</td>
<td>.14*</td>
<td>.21**</td>
</tr>
<tr>
<td>TDDS Total</td>
<td>-.04</td>
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<td>.23***</td>
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<td>.77***</td>
<td>.85***</td>
<td>.70***</td>
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<td>TDDS Pathogen</td>
<td>-.05</td>
<td>.05</td>
<td>.20**</td>
<td>.78***</td>
<td>1</td>
<td>.57***</td>
<td>.27***</td>
</tr>
<tr>
<td>TDDS Sexual</td>
<td>-.07</td>
<td>-.01</td>
<td>.14*</td>
<td>.85***</td>
<td>.58***</td>
<td>1</td>
<td>.34***</td>
</tr>
<tr>
<td>TDDS Moral</td>
<td>.03</td>
<td>.08</td>
<td>.21**</td>
<td>.70***</td>
<td>.27***</td>
<td>.36***</td>
<td>1</td>
</tr>
</tbody>
</table>

**Note:** (N = 260); PTCI = Post Traumatic Cognitions Inventory; PIOS = Pennsylvania Inventory of Scrupulosity; OBQ-44 = Obsessive Beliefs Questionnaire; TDDS = Three Domains of Disgust; \( p < .001^{***} \); \( p < .01^{**} \); \( p < .05^{*} \)

Following correlational analyses, a hierarchical linear regression (similar to the primary analysis) was conducted in which the PIOS and OBQ-44 were entered in step one, followed by the TDDS total scale score in step two (see Table 4). The hierarchical regression revealed that scrupulosity and obsessionality contributed significantly to the regression model, \( F(2, 259 = 47.22, p < .001) \), and accounted for 26.3% of the variance. When the TDDS was added to the model in step two, the model was still significant, \( F(3, 259 = 34.385, p < .001) \), demonstrating that the TDDS uniquely accounted for 1.8% of variance in PTS symptoms.
Table 4. Summary of Post Hoc Hierarchical Linear Regression with PIOS, OBQ-44, TDDS

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>Beta</th>
<th>Change R²</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1: Scrupulosity/Obsessionality (PIOS/OBQ-44)</td>
<td>.74</td>
<td>.11</td>
<td>.35</td>
<td>.27</td>
<td>&lt;.001**</td>
</tr>
<tr>
<td></td>
<td>.29</td>
<td>.05</td>
<td>.31</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 2: Disgust (TDDS)</td>
<td>-.18</td>
<td>.07</td>
<td>-.14</td>
<td>.02</td>
<td>&lt;.001**</td>
</tr>
</tbody>
</table>

Note: (N = 260); PIOS = Pennsylvania Inventory of Scrupulosity; OBQ-44 = Obsessive Beliefs Questionnaire 44; TDDS = Three Domains of Disgust Scale; p < .001**

To further understand the specific relation between the TDDS and PTSS symptoms, the regression was again run including all subscales of the TDDS in the second step. Once again, scrupulosity and obsessionality contributed significantly to the model F (2, 259 = 47.22, p < .001), and accounted for 26.3% of the variance. When each of the subscales were added in step two, the model remained significant, F (5, 259 = 20.67, p < .001), demonstrating that together the subscales uniquely accounted for 1.2% of the variance in PTS symptoms (see Table 5). However, individually, no subscale contribution was significant.

Table 5. Summary of Post Hoc Hierarchical Linear Regression with PIOS, OBQ-44 and TDDS Subscales

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>Beta</th>
<th>Change R²</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1: Scrupulosity/Obsessionality (PIOS/OBQ-44)</td>
<td>.735</td>
<td>.114</td>
<td>.352</td>
<td>.027</td>
<td>&lt;.001**</td>
</tr>
<tr>
<td></td>
<td>.263</td>
<td>.045</td>
<td>.316</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 2: TDDS Moral</td>
<td>-.083</td>
<td>.170</td>
<td>-.028</td>
<td>.02</td>
<td>&lt;.001**</td>
</tr>
<tr>
<td></td>
<td>-.320</td>
<td>.214</td>
<td>-.098</td>
<td></td>
<td>.627</td>
</tr>
<tr>
<td></td>
<td>-.142</td>
<td>.180</td>
<td>-.053</td>
<td></td>
<td>.136</td>
</tr>
</tbody>
</table>

Note: PIOS = Pennsylvania Inventory of Scrupulosity; OBQ-44 = Obsessive Beliefs Questionnaire-44; TDDS = Three Domains of Disgust; p <.001**
III. DISCUSSION

The current study aimed to assess the potential relations between the construct of moral disgust, scrupulosity, obsessionality and post traumatic stress symptoms (PTSS). It was hypothesized that moral disgust, obsessionality, and scrupulosity would be positively correlated with PTSS. As hypothesized, scrupulosity was positively correlated with PTSS. Similarly, obsessionality and trauma symptoms were significantly correlated. Moral disgust was not significantly correlated to posttraumatic stress symptoms or scrupulosity. However, moral disgust ratings measured by the moral disgust subscale of the TDDS were significantly correlated to obsessionality, suggesting that disgust related to moral or social transgressions may play a role in obsessive tendencies. This relation further supports previous findings in the literature concerning the role of morality in the development of obsessive thoughts in obsessive compulsive disorder (Abromovitch et al., 2013). More specifically, Abromovitch and colleagues (2013) found that individuals’ views of self-incompetence related to morality, were strongly associated to demonstration of OCD cognitive biases.

In an effort to better understand the relation between all of the variables, a hierarchical linear regression was conducted. Analyses revealed that scrupulosity and obsessionality significantly predicted posttraumatic stress symptoms; however, adding moral disgust to the model did not contribute unique predictive variance. This was surprising as previous research has indicated disgust, as an overall construct, plays a role in the experience of PTSS (Bomyea & Amir, 2010; Olatunji et al., 2012; Engelhard, Olatunji, & Jong, 2011). In particular, when assessing veterans returning from deployment, researchers found that peritraumatic disgust and
higher disgust propensity and anxiety were found to be associated with development of PTSS. In addition, disgust sensitivity was found to be a moderator in the relationship between peritraumatic disgust and severity of PTSS (Olatunji et al., 2012; Engelhard, Olatunji, & Jong, 2011).

As the literature thus far has focused primarily on the overall construct of disgust, in an effort to better understand the relationship between the constructs, post hoc analyses were conducted. Specifically, the aim was to assess the relation between the construct of disgust as a whole, and include all other sub-domains measured by the TDDS, with constructs of scrupulosity, PTSS, and obsessionality. Similar to the primary analysis, neither the TDDS total scale, nor any subscales of the TDDS were significantly associated with PTSS. Again, a hierarchical regression was performed to look at the potential predictive utility of the scale. When entered together in the second step, the total TDDS accounted for a small, yet unique variance in PTSS above and beyond obsessionality and scrupulosity. This illustrates that although only a small effect in this sample, disgust plays a role in the etiology of PTSS. This finding supports previous research that disgust as an overall construct is related to PTSS (Bomyea & Amir, 2010; Olatunji et al., 2012; Engelhard, Olatunji, & Jong, 2011) despite initial analyses revealing that the moral disgust subscale was not. While none of the subscales of the TDDS were uniquely predictive of PTSS, the overall construct of disgust was. This particular finding may be suggestive of a lack of consensus and psychometric clarity in the definition of each of the domains of disgust. Perhaps within the TDDS each of the subscales contain pertinent characteristics which map onto different domains of disgust that, when combined in the overall measure, capture the variance accounted for in PTSS. It could be argued that it is not one particular domain of disgust that accounts for the development of PTSS, but rather unique
characteristics and propensities from each of the subscales. For instance, strictly moral and social transgressions may not account significantly for PTSS, but the addition of contamination and animal-reminder disgust factors may foster a distinctive relationship among disgust variables. This argument suggests further need for operational definitions and psychometric development of each of the domains of disgust. While the relation between particular disgust domains (core, animal reminder, contamination) and psychological disorders (specific phobias, obsessive compulsive disorder) have been established (Olatunji et al., 2008; Olatunji et al., 2010), further research to parse out the shared characteristics of each of the domains of disgust is necessary. For instance, in relevance to the current study, it was anticipated that moral transgressions would positively relate and account for the development of PTSS. However, when conceptualizing morally disgusting transgressions captured by the TDDS subscale, (i.e., “watching a pornographic video,” TDDS, Tybur et al., 2009) it may be argued that this subscale score also elicits animal-reminder disgust as it involves violation of the body envelope. The inability to truly delineate one domain from another may provide information as to how the overall construct was significant within this present model when all subscales were not.

Results may also be indicative that the construct of disgust (in particular the moral domain) may only be related to specific trauma types. For example, it could be that traumas related to natural disasters and more externally oriented negative events do not elicit the same disgust response as those more personal in nature (e.g. sexual trauma) or related to potential moral questions (e.g. killing a child in combat who would otherwise bomb your platoon). While the experience of externally oriented trauma is not to be minimized in its hardship or repercussions, it may be argued that traumas, which impact an individual’s sense of self, may elicit a moral disgust reaction that heightens or readily contributes to the experience of PTSS.
There is still much to be learned about the overall construct of disgust and in particular how the moral disgust domain differentially relates to psychopathology.

Perhaps most pertinent to this area of research is the limited consensus regarding the operational definition and subsequent measurement of the construct of moral disgust. Due to this lack of definition regarding what constitutes the construct of moral disgust, current measurement may not be adequately explicating the construct. Although the Three Domains of Disgust Scale (TDDS) has been documented as psychometrically valid to a marginal degree, research is limited. With the exception of the initial publication of the TDDS, only one study has re-examined the psychometrics of the scale. In particular, Olatunji et al. (2012) found strong convergent and divergent validity for the the pathogen and sexual disgust subscales, but these were more limited for the moral disgust scale. In terms of measuring the defined construct of moral disgust, the TDDS is lacking in its ability to adequately measure an array of transgressions that are thought to elicit moral disgust. Tybur et al., (2009) define moral disgust as that “which motivates the avoidance of social norm violators.” For example, within the moral subscale of the TDDS, items are more centrally focused on socio-moral transgressions such as “Intentionally lying during a business transaction,” or “A student cheating to get good grades,” (Tybur et al., 2009). While these items are related to moral transgressions, it may be argued that these particular acts do not adequately reflect the construct of moral disgust as it would relate to one’s emotions regarding more disgust eliciting acts such as sexual assault, murder, religious oriented transgression (e.g., bible burning), poverty, and so forth. Similar conclusions have been posited in the psychometric study which revealed that the moral disgust subscale is particularly limited due to the lack of theoretical consistency (Olatunji et al., 2012).
Perhaps in an effort to truly grasp the full scope of moral disgust, a measure which approaches the domain from anthropologist Richard Shweder’s (1997) “big three” moral transgression view of ethics would offer sufficient operationalization. Shweder’s approach and ideas on the theory of morality focused on three ethical codes that guide interaction: Community, Autonomy, and Divinity (Dubreuil, 2010). Community facets relate to social norms, while autonomy aims to detail the respect of others’ rights, and divinity is described as those actions that may violate practices of the sacrament or purity (Dubreuil, 2010). From this operationalization, using Haynes et al. 1995 directions for scale construction could produce a new, improved measure of the construct of moral disgust. A new, more sensitive measure may then work to accurately research and promote understanding of the construct of moral disgust related to other constructs of interest.

Limitations

Although this study added to the paucity of literature in the domain of moral disgust, some important limitations need to be addressed. It is likely that some of these limitations actively contributed to the somewhat unexpected findings. First, the study employed a non-clinical sample of college students. While some may have experienced trauma and developed symptoms of PTSD, for this preliminary investigation a convenience sample was recruited. Although some variance in symptom presentation was demonstrated, it could be that the hypothesized relations only occur at high symptom severity/distress. As such, replication of this study in a clinical population would be able to address this limitation.

Second, there is a lack of definitive evidence of whether domains of disgust (particularly moral disgust) are more related to specific types of trauma. Further research in this area could provide a better understanding as to how the experiences of particular traumas (i.e., internal) may
be more directly related to the emotional experience of disgust during the time of the trauma. The ability to conceptualize how specific traumas relate to emotional experiences may be pertinent to identifying the function of emotions in the etiology of psychopathologies such as PTSD.

Third, the lack of operational definition regarding the construct of moral disgust may be largely affecting the ability for proper measurement. Research is still needed to understand which aspects of moral disgust are exclusive to the specific domain. It is concerning how much overlap exists between each of the domains of disgust. This is a particular problem as it relates to the vignettes currently used in measurement. These examples often fail to apply to only one domain of disgust. By parsing out the characteristics of each domain which make up unique subscales, an opportunity to develop more precise vignettes and measurement may be afforded.

Future Directions

At the conclusion of the current study, some initial questions remain unanswered and new questions are presented. Is the domain of moral disgust, in particular, related to the development of PTSS? Though the overall construct of disgust is related to PTSS, questions still remain in regards to how the the overall construct is significant. This is of particular interest as each of the subscales of the TDDS failed to demonstrate a significant relationship with PTSS. These questions create an opportunity to explore how the overall construct of disgust is uniquely associated with PTSS. In an effort to answer these questions, it is important to continue with research in this area by building from the current literature. As previously mentioned, there is an understanding that moral disgust elicits a developed disgust reaction signified by facial expression or implicit thought in the presence of social transgressions, verbal or visual violations to moral standards (Chapman & Anderson, 2013). In particular, this domain is closely tied to
physical disgust reminders as it relates to transgressions such as incest, and items that are otherwise thought to be profane (Chapman & Anderson, 2013). However, research has demonstrated that moral disgust functions independently of physically disgusting events and is a unique emotional experience (Chapman & Anderson, 2013). For future research, efforts must be concentrated on delineating the construct of moral disgust. As this is a construct that likely relates to more internally focused types of difficulties, it is important to further understanding about how it functions in response to particular stimuli. By using Schweder’s “big three” model of moral transgressions of ethics, comprehension of how moral disgust surpasses simple purity or religious transgressions into the realm of social issues may be better assessed. Only once research is able to provide a clear definition on the construct, will it be possible to create a more precise measurement which may truly reflect the desired material to be measured.

Following proper operationalization and test construction of a valid measure of moral disgust, assessing the overarching research question of this particular study (i.e., does moral disgust relate to PTSS) would allow for increased knowledge of this construct and its relationship to psychopathologies or constructs of individual differences. In an effort to do this in the most effective manner, research using a clinical PTSD sample focused on the examination and comparison of different types of traumas (i.e., internal verses external) may elucidate the role of moral disgust in different types of trauma. The specificity and comparison of samples (e.g., trauma type, clinical/non-clinical population) may provide information pertaining to the development of PTSS. A clinical sample diagnosed with PTSD may allow for a better conceptualization of how particular traumas may activate individual differences in disgust propensities and sensitivities.
Summary/Conclusions

The current study hypothesized that moral disgust, scrupulosity, and obsessionality would be positively correlated with post traumatic stress symptoms. It was further posited that when controlling for scrupulosity and obsessionality, moral disgust would predict PTSS. Contrary to hypotheses, moral disgust was not correlated to PTSS, though scrupulosity and obsessionality were. Moral disgust did correlate positively with obsessionality; however, it did not contribute significantly to the unique predictive variance in the regression model when controlling for scrupulosity and obsessionality. Interestingly, when entering disgust as a whole construct, unique variance was accounted for above and beyond variance explained by obsessionality and scrupulosity. These findings further support previous literature suggesting that disgust as a construct plays a unique role in various psychopathologies, particularly, PTSS. The current study contributes information regarding the need to better conceptualize the specific domains of disgust with a focus primarily on moral disgust.
LIST OF REFERENCES
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EDUCATION

2013 - Present  University of Mississippi
Clinical Psychology Graduate Student
M.A. May, 2015
Masters thesis (2015): Scrupulosity Trauma and Disgust, Oh My!: Assessing the potential relation between disgust and trauma symptoms
Advisor Danielle Maack, Ph.D.

2009 – 2013  Bachelor of Arts, Psychology
University of Mississippi
Graduated Magna Cum Laude
Minor: English
Honors Thesis: Socio-economic status as a contributing factor in loneliness in school aged youth.

RESEARCH INTERESTS

• Individual differences and vulnerabilities to psychopathology
• Behavioral transmission of vulnerability and learned characteristics between parents and children
• Protective factors and coping strategies in children affected by illness
PROFESSIONAL PRESENTATIONS

RESEARCH TALKS


POSTER PRESENTATIONS


34
SYMPOSIA


RESEARCH EXPERIENCE

09/2014 - present  Research Assistant for Valerie Crabtree, Ph. D., St. Jude Children’s Research Hospital
  • Assist in protocol and grant development
  • Peer review articles for journal publication
  • Assist with assessment scoring and interpretation

08/2015-04/2016  Mental Health Consultant for Headstart Centers, Supervised by Alan Gross, Ph.D.
  • Observed teachers and children in classroom
  • Provided behavior management tools and techniques to teachers
  • Held parent conferences in an effort to provide helpful behavioral management tools to be implemented at home

01/2016 – present  Research Assistant for Instrument Validation Protocol, University of Mississippi Medical Center, Pediatric Emergency Room
  • Administer the Mini International Neuropsychiatric Interview for Children and Adolescents (MINI-KID) to youth ages 12-18
  • Assist with assessment scoring and interpretation

08/2013 - 12/2015  Thesis Research
  • Prepared in depth literature review on the topic of moral disgust, scrupulosity and post traumatic stress symptoms.
  • Designed study to test hypothesis using appropriate statistical analysis

05/2012- 08/2015  Lead Research Assistant for Disgust and Anxiety Collaborative directed by Danielle Maack, Ph.D. and John Young, Ph.D.
  • Assist in training new research assistants on the ADIS and study protocol
  • Conduct study protocol for research participants (structured interview, behavioral tasks and self report questionnaires)
  • Create participant packets
  • Coordinate research assistant’s schedules, CITI trainings etc.

01/2013 - 05/2013  Research Assistant for Laura Johnson, Ph.D.
• Assisted in administration of self-report instruments in Tanzania for a pilot study
• Collaborated with Tanzanian researchers to develop Swahili version of instruments
• Entered data

10/2010-05/2012 Research Assistant for John Young, Ph.D.
• Administered structured interview (ADIS)
• Became familiar with common self-report instruments and self-report instruments (e.g. DASS-21; UCLA Loneliness Scale; GHQ, ASI-3, OCI-R, SIAS, PCL-C, etc)
• Ran participants through lab study protocols including administration of behavioral-avoidance tasks

CLINICAL EXPERIENCE

08/2013 - 08/2015 Clinical Practicum
University of Mississippi
Mood and Anxiety Disorders Team
Supervisor: Danielle Maack, Ph.D.
• Attend weekly supervision meetings for students with clients
• Participate in didactics related to case conceptualization, treatment planning and implementation of behavioral interventions

08/2015 - 05/2016 Clinical Practicum
University of Mississippi
Supervisor: John Young, Ph.D.
• Attend weekly supervision meetings for students with clients
• Participate in didactics related to case conceptualization, treatment planning and implementation of behavioral interventions

PROFESSIONAL MEMBERSHIPS and COMMITTEES

Association for Behavioral and Cognitive Therapies (2013- present)

Society of Pediatric Psychology, Division 54 of American Psychological Association (2016)

Psi Chi, The International Honor Society in Psychology (2012-present)
• Vice President (2012-2013)

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